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Journal of the Society of Arts.

FRIDAY, JANUARY 25, 1861.

EXAMINATIONS.—LOCAL BOARDS.

Those Secretaries of Institutions who have not already forwarded Lists of their Local Educational

Boards are requested to do so as soon as possible, not omitting to specify the Chairman and Secretary.

Copies of the Programme of Examinations for the present year may be obtained by members of any of these Boards on application to the Secretary of the Society of Arts. In this will be found full instructions for their guidance in making the necessary arrangements for co-operating with the Society of Arts.

GUARANTEE FUND FOR THE EXHIBITION OF 1862.

It will be remembered that the late Mr. Matthew Uzielli was the first gentleman who came forward as a Guarantor for the Exhibition of 1862, having promised his name for £10,000, but his death before the execution of the Guarantee Deed left no liability on his estate. The Council, however, have much pleasure in announcing that Mrs. Uzielli has, in the most liberal manner, intimated her intention of guaranteeing to the amount of £5,000, and Mr. Theodosius Uzielli has, with similar liberality, promised his own name for £3,000.

The following additions and alterations have been made since the last announcement in the *Journal* for January 11:—

NAME.	AMOUNT.	REPRESENTING THE OBJECTS OF THE SOCIETY—ARTS, MA- NUFACURES, AND COMMERCE.
Amount last announced	£372,000	
Less by the death of Mr. Matthew Uzielli	10,000	
	£362,000	
Mrs. Uzielli, Hanover Lodge, Regent's-park, N.W.	5,000	Arts.
Theodosius Uzielli, 114, Piccadilly, W.	3,000	Arts.
*R. J. Mackintosh, M.A., 2, Hyde-park-terrace, Kensington-gate, S.W.	100	Arts.
Total	£370,100	

BY ORDER,

P. LE NEVE FOSTER, *Secretary.*

INTERNATIONAL EXHIBITION OF 1862.

The following letter has been addressed, by direction of the Senate of the Ionian Islands, to the President of the Ionian Association, promising the support of the Government to an Industrial Exhibition which is to be held at Corfu. In the programme of this Exhibition it is stated, that the articles which obtain the principal prizes will be forwarded gratuitously to England, in order to their being placed in the International Exhibition of 1862:—

Senate Office, Corfu, 3rd January, 1861.

SIR.—The Senate, in furtherance of their desire to afford every support to the noble efforts of the Ionian Association directed to the development of Ionian industry and its advancement to perfection in its several branches, consent with pleasure to your request respecting the appointment of Commissions invested with authority in each island, for the purpose of co-operating in the preparation and organisation of the Exhibition announced by the Society to be held in 1862.

The Senate therefore nominate a Central Commission in Corfu, composed of the Regent, the Secretary to his

Excellency the Lord High Commissioner, the Municipal Officer superintending Agriculture and National Industry, Col. Wynne, R.E., Sig. Antonio Polila, Dr. Napoleone Zambelli, Sig. Alessandro Grollo, Sig. Nicolò Ventura, and Sig. Spiridione Marcoran. The Regent will be the President of the said Commission, and the Secretary to the Lord High Commissioner the Vice President.

The Central Commission will appoint their own Secretary.

In each of the other islands there will be a Local Commission, composed also of the respective regents, and the municipal officer superintending agriculture and national industry; and his Excellency's concurrence will be solicited in appointing the residents to the Presidency of these Commissions, and in giving them instructions to that effect.

The Local Commissions may increase the number of their members by aggregating persons whose respectability, resources, and love of progress and national industry entitle them to consideration, provided the total number of members in each Commission do not exceed nine.

The object of the Central and the Local Commissions will be, to give a suitable impulse to persons or societies engaged in the different branches of Industry contemplated for the Exhibition, to prepare and complete the productions or the works of Art to be displayed on that occasion, and to afford such persons or societies every necessary facility and assistance in the preparation and conveyance of the several articles to Corfu, as well as in the transfer

of persons interested, recommending to Government all those necessary measures which could not be taken without its decisions and its intervention.

The Local Commissions, with regard to all purposes connected with their Warrant, will correspond with the Central Commission, which must be informed of all their proceedings and their gradual success; and the Central Commission will have the right of giving the Local Commissions such opportune instructions as may be occasionally required.

The Central Commission will communicate directly with the Council of the Ionian Association, either for the purpose of ascertaining their opinion when necessary, or of reporting the progress of the several Commissions for the information of the whole Society.

The Senate entertains a well-founded hope that the Commissions established will evince their patriotic zeal in promoting an object so highly important as the encouragement and the progress of National Industry, and that the honourable exertions of the Ionian Association will be crowned with success.

Having thus replied to the letter with which you honoured me on the 18th December, 1860, I hasten to inform you that the Senate came to these decisions on the recommendation also of his Excellency the Lord High Commissioner.

I have the honour to be, &c.,
A. L. DUSMANI.
Secretary of the Senate for the
General Department.

Antonio Polila, Esq.,
President of the Ionian Islands, &c., &c., &c., Corfu.

THE SOCIETY'S EXAMINATIONS.— GOVERNMENT APPOINTMENTS.

At the recent examination by the Civil Service Commissioners, the following candidates, all of whom had distinguished themselves at the Society of Arts' Examinations, were successful in obtaining appointments:—

Mr. Henry Simpson, Messrs. Chance's Library and Reading-room, Birmingham.
Mr. Archibald S. L. Macdonald, Glasgow Mechanics' Institution.
Mr. Jos. Marshall Carpenter, Sussex Hall Evening Classes.
Mr. William Vaughan, " "

The first two were nominated to this competition by the Council of the Society, Lord Granville having kindly placed nominations at their disposal. Five appointments were given on this occasion.

ARTISTIC COPYRIGHT.

A meeting of the Committee took place at the Society's rooms, on Thursday, the 17th instant. Sir Charles L. Eastlake, P.R.A., in the Chair.

Sir Thomas Phillips, Chairman of the Council, reported to the meeting that a Deputation from this Committee, consisting of Sir C. L. Eastlake, Sir E. Landseer, R.A., Messrs. Mulready, R.A., E. Field, Wm. Hawes, A. W. Redgrave, and himself, accompanied by the Secretary, had had an interview with the Attorney-General, to whom the objects of this Committee were explained. The Attorney-General had expressed his willingness to assist the Committee in settling the Bill

and to take charge of it in the House of Commons, and promised to urge upon Lord Palmerston the propriety of its being introduced into Parliament as a Government measure.

A resolution was thereupon passed, conveying the thanks of the Committee to the Attorney-General, for the attention he had given to the Bill, and for his promise to aid in promoting its success in the House of Commons.

Sub-committees were appointed to confer with the Attorney-General in settling the terms of the Bill, and for taking such measures as may be deemed necessary for forwarding the views of the Committee.

On Tuesday, the 22nd inst., a deputation from this Committee had an interview with Sir George C. Lewis, at the Home-office. The deputation consisted of Sir Charles L. Eastlake, P.R.A., Sir E. Landseer, R.A., Sir Thomas Phillips, Messrs. Mulready, R.A., G. T. Doo, R.A., E. Field, Wm. Hawes, A. W. Redgrave, (Hon. Sec. of the Committee), J. M. Dodd, and the Secretary of the Society of Arts.

SEVENTH ORDINARY MEETING.

WEDNESDAY, JANUARY 23, 1861.

The Seventh Ordinary Meeting of the One Hundred and Seventh Session, was held on Wednesday, the 23rd inst., J. Griffith Frith, Esq., Member of the Council, in the chair.

The following gentlemen were proposed for election as members of the Society:—

Brown, John	Rose-hill, Chesterfield.
Burzorjee, Dr.....	{ Northwick-lodge, St. John's-wood-road, N.W.
Crockford, Joshua	212, Euston-road, N.W.
Irvine, Robert	Black Hurlet, near Glasgow.
Scott, Sir Francis E.,	{ Great Barr Hall, near Birmingham.
Bart.	ham.
Tennant, Thomas M...	Newington Works, Edinburgh.
Walter, William Thos.	19, Long-acre, W.C.
Wilkinson, John	St. Helen's Mills, Leeds.
Wilson, George, jun....	West Hurlet, near Glasgow.

The following candidates were balloted for and duly elected members of the Society:—

Bertram, George.....	Sciences-street, Edinburgh.
Bucknall, William Miles	Board of Trade, Whitehall, S.W.
Budgett, John P.	{ Henleaze-park, Westbury-on-Trym.
Chambers, Charles	Broomhall-park, Sheffield.
Goldschmidt, Otto	{ Argyle Lodge, Wimbledon-common, S.W.
Hands, Medwin	4, White-street, Coventry.
King, John Huffam ...	66, Hatton-garden, E.C.
Knott, William	{ Bentcliffe, Saddleworth, near Manchester.
Leahy, Francis	Shanakiel House, Cork.
Lorsont, Jean Baptiste	56, Cannon-street west, E.C.
Athanase	
Moody William	{ 6, King's Bench-walk, Temple, E.C.
Pakington, J. Slaney ...	Kent's-green, Worcester.
Richardson, Samuel	Doncaster-street, Sheffield.

Robinson, George	Water-street Dock-yard, Cork.
Thompson, M. W.	Park-gate, Guiseley, Leeds.
Veitch, James, jun.	Exotic Nursery, King's-road, Chelsea, S.W.
Wood, George	Bradford.

Previously to the reading of the paper, the Secretary called attention to Mr. Holland's arrangement for fastening Miners' Safety Lamps, of which a description will be found at page 151.

The Paper read was—

TEA, AND ITS PRODUCTION IN VARIOUS COUNTRIES.

By LEONARD WRAY.

When we consider the quantity of tea consumed in the British dominions, and the money value which that quantity represents, we must be struck with the great commercial importance this article has attained. Yet I believe it is universally admitted, that of late years, as the supply has gone on increasing, so as the quality continued to fall off; until we can at present put but small faith in the purity of nine-tenths of the tea sold in this country.

Our millions demand an ever increasing quantity of cheap tea; and accordingly an article is made up and sold to them, at an apparently low price. But what do the buyers actually obtain for their money? It is the semblance of tea, but not the reality,—a veritable delusion and imposture.

The adulteration of tea is on so monstrous a scale, and the result is so eminently injurious to the health of our people, that it becomes an absolute duty to the public, not only that these fraudulent practices should be thoroughly understood, but that vigorous measures should be instituted with a view to remedy this great and crying evil. We want a very abundant supply of good and wholesome tea:—so cheap that the poorest may buy it, and so good that, having bought it, a beverage can be made from it, which they can partake of with comfort and advantage to themselves and families. This is really a consideration which should awaken the liveliest interest in every household throughout the length and breadth of the land,— for all are more or less affected by it. Such, then, being the case, I have the greater confidence in be-speaking your attention to the several points which I am about to offer for your consideration.

We are indebted, as you know, to the Chinese for our knowledge of this interesting plant and its uses; but how long that ancient people themselves have employed its leaves in making a beverage, no one can now, by any possibility, determine. Some Chinese authorities assert that its virtues were first made known during the reign of their Emperor Shin Nong, or 3,254 years B.C.—but the great antiquity this date would confer, has been, I think, may say, carped at, rather than disputed, by European writers, who seem to find a singular gratification in decrying the historical and traditional records of the Chinese. I think that there is no improbability whatever in the Chinese account; indeed, I am quite prepared to believe that they might have known its utility and largely used it, for a very long, long time, before it obtained any place in their written or traditional records.

The employment of the leaves, berries, and roots of plants may be considered to be one of the very first resorts of mankind, to 'appease those pangs of hunger which often press so heavily upon poor humanity, when existing in its most primitive state. Hence we find that those barbarous savages, who are existing in the most primitive condition, possess a seemingly instinctive knowledge of the alimentary value of the herbs whereby they are surrounded, and to which they are so frequently compelled to have recourse in order to sustain their very lives. But let us institute one comparison, viz., as to the probable priority in

point of time, in the usage of tea and in the usage of wheat by mankind,—the former a wild plant, the latter a cultivated grain. Who will venture to say how many thousands of years B.C. this grain was cultivated and made into bread or cakes by man?

Historians allow an antiquity of 2123 years B.C. to the great pyramid of Gizah, in Egypt, and we may ask what was the condition of China in those days? Was she not as far advanced in the arts and sciences as Egypt? At any rate she claims for herself, and apparently with good reason, an antiquity much greater than Egypt. Bread was made, and contributed to the support of the Egyptians and other people no doubt many thousands of years before the pyramid of Gizah was built. Why is it improbable, then, that so simple a matter as the infusion of dried tea leaves, should have been known and practised by the Chinese at an equally remote period? A very great many arguments might be added to these, were it either necessary or desirable to do so, but I will not waste the time before us. It will suffice for us to know that the tea plant has been cultivated, and its leaves have been used by the Chinese, from a very remote time; and we can easily understand that the present very peculiar methods of manipulating the leaves, in order to obtain different kinds of tea, were not arrived at all at once, but were the result of long-continued practice and experience.

Some European writers have, with singular perversity, questioned the fact of the tea plant being indigenous to the soil of China Proper, and have asserted that it came originally from the Corea, in Mantchoo Tartary; but these assertions have been convincingly disproved by the comparatively recent discovery (by English botanists and travellers) of the true tea plant growing wild in the forests and jungles of Upper Assam, the Sylhet hills, and in other localities within the British territory in the Himalaya. In fact, the mountain range, nearly from the great river Yang-tse-keang to the south-western frontier of China, may be considered to be but a continuation of the Himalayan mountains, and along the greater part of this immense distance the plant has been discovered growing wild. Moreover, the Chinese accounts all agree that the tea tree was first discovered where it is found growing at the present day—namely, among the hills and mountains in the central provinces of the empire. In many of the Chinese provinces it is still existing in a wild state in great profusion, and Landers speaks of it as forming a “tea forest” on a mountain range near Zemmie, the capital of the Shan country; whilst it also grows wild throughout the jungle-covered mountains of Upper Burmah.

Ball says, "It appears that the tea tree is not only indigenous in China, but that it is cultivated throughout the empire, in the northern climate of Pe-chy-ly, and in the southern one of Quong-tong. * * * * * It also grows in Japan, Corea, the Lee-kieu Islands, Chusan, Tonkin, and in Cochin China."

It is scarcely wise, therefore, to contest with the Chinese either in respect to the fact of its being indigenous to their country, or as to the antiquity of its use in that empire.

THE TEA PLANT AND ITS VARIETIES.

The tea plant is of the genus *Thea* (Kaempfer), belonging to the order *Ternstræmiaceæ*, and is so nearly allied to the genus *Camellia*, that no small disputation took place some years ago as to whether they were not absolutely of one genus, instead of forming two separate genera, as Linnaeus asserted. Without employing time in such a discussion as this, however, we may remark, *en passant*, that botanists themselves have had a difficulty in distinguishing between, and identifying, plants of the *Thea* and of the *Camellia* genus.

It is now generally allowed that there are three recognised varieties of the tea plant, although there has been many a battle amongst botanists as to whether these are not three distinct species, instead of being merely varieties of one and the same species.

That very sad fellow Darwin had not, at that time,

shocked the susceptibilities of the faithful, with his profound theories on the "Origin of Species;" but there was even then a man—a bold and clever botanist, named J. W. Masters—who roundly maintained (in the pages of the "Agri-Horticultural Society of India's Journal") that these so-called species were, in reality, only varieties of the same species.

The plants disputed about are known as the *Thea Bohea*, *Thea Viridis* (*Sinensis*), and the *Thea Viridis* (*Assamica*); the two former being natives of China, and the

FIG. I.



latter of Assam. In a very elaborate comparison of the specific characters of the *Thea Viridis* of China, and the *Thea Assamica*, Mr. Masters endeavours to prove that they are identical, or very nearly so; and he also says:—“The only difference existing between the Assam plant and the China *Bohea* plant, is found in the texture of the leaf. The Assam leaf is long, thin, membranous, often

undulated; whilst the China leaf is short, thick, coriaceous, and generally straight. And although, in the general appearance and habit of the two plants, there is a marked difference, yet the seeds which were sent from China as those of the true tea have produced plants differing more from each other than the generality of them do from the Assam plant.”

Dr. W. Jameson, Superintendent of the Botanical Gardens, North Western Provinces, in a very able report to the Indian Government, dated 30th July, 1847, says:—“In the plantations (those of Kumaon and Gurhwal) there are two species (varieties?), and two well-marked varieties. The first species (Fig. 1) is characterised by

the leaves being of a pale-green colour, thin, almost membranous, broad lanceolate, sinuates or edge irregular and reversed, length from three to six inches. The stem of newly-formed shoots is of a pale reddish colour, and green towards the end. The plant is also marked by its strong growth, its erect stem, and the shoots being gene-

FIG. II.



Thea Bohea.

rally upright and stiff. The flowers are but small, and it bears but sparingly. In its characters this plant (received from Assam) agrees in part with those assigned by Dr. Lettsom and Sir W. Hooker to the *Thea Viridis* of China, but differs in its branches being stiff and erect. * * * By the Chinese manufacturers it is considered

an inferior plant for tea-making, and is not, therefore, grown (here) to any extent.”

“The second species (variety?) see Fig. 2, is characterised by its leaves being much smaller, and not so broadly lanceolate; slightly waved, of a dark green colour; thick and coriaceous; sinuate or edge irregular; length

from one to three and a half inches. In its growth it is much smaller than the former, and throws out numerous spreading branches, and seldom presents its marked leading stem. This species agrees well with the characters assigned to the *Thea Bohea*; it was brought from Amoy, in China, by Dr. Gordon, and it forms nearly the whole of the plantations in Kumaon and Gurhwal.

"In the plantations there is a third plant, which, however, can only be considered a marked variety of *Thea Bohea*. Its leaves are thick, coriaceous, and of a dark green colour, but invariably very small, and not exceeding two inches in length, and thinly lanceolate; the serratures too on the edge, which are straight, are not so deep. In other characters they are identical. This marked variety was received from Calcutta at the plantation in a separate dispatch from the others." (See Fig. 3.)

Mr. Robert Fortune, who so carefully explored the tea districts of China, distinctly says, that the *Thea Viridis* is universally cultivated in the northern provinces of China; that it is a much more hardy, free growing, and abundant producer than the *Thea Bohea*, which is confined to the more southern provinces. But there can be no doubt that both varieties abound in the central and southern provinces, although individual cultivators, and even whole districts of cultivators may, and assuredly do, pride themselves upon the purity and excellence of the particular variety they cultivate.

We must not, however, for one moment, take so erroneous and unnatural a view of this question as to suppose that there are not an immense number of varieties of the tea plant growing both in China and in every other country where it has long been cultivated; nor need we bind ourselves to the argument in favour of there being more than one species*, for we have so many instances in the vegetable kingdom of the wonderfully different forms into which varieties of one species will run, that we know from these every-day experiences how easily those variations may be reconciled. Look at the infinite number of varieties into which the apple and pear have run; or just take a glance at all our cultivated plants, and you will readily understand that in presenting itself under several different forms, the tea plant is only behaving as all other plants do. It is well known that some tea plants will produce seed vessels or pods, containing one, or at most two seeds; others containing two, or at most four seeds, whilst on other plants the pods contain from three to seven seeds. There is, however, nothing so very remarkable in all this. When we consider the changes brought about by the influences of climate, soil, season, and of peculiar modes of culture, combined with the natural tendency of all plants, I think we cannot come to any other conclusion than that arrived at by Mr. Masters, in summing up his observations on the Assam tea plant, viz., that they are all mere varieties of the same species.

The following are his very striking remarks:—

"Finally, having carefully examined living specimens, I have come to the conclusion that the Assam tea plant is identical with *Thea viridis* (as described in 'Rees's Cyclopaedia'); and that the China tea plant, now growing in Assam, and supposed to be the true *Thea bohea*, differs from the Assam plant only in size and texture of leaves, the time of its flowering, the number of its flowers, and the abundance of its fruit. These differences, even trifling as they are, are not constant, for the China plant, when left to itself, approaches to the habit of the Assam plant; and the Assam plant under cultivation, and subject to the loss of its leaves, assimilates to the Chinese plant,

both in size and texture of its leaves, and also in its multiflorous habit."

DISCOVERY OF THE TEA PLANT IN BRITISH INDIA.

I have already alluded to the Assam tea plant; but let us for a moment direct our attention to the magnificent prospects opened up to India, by the discovery of this most valuable plant being indigenous within her borders.

About the year 1824, Major Bruce and his brother, Mr. C. A. Bruce, were stationed in Upper Assam, and, finding the tea tree growing wild, made the fact known to Mr. David Scott, a very active, intelligent, and scientific official, who very soon brought it under the notice of the late Dr. N. Wallich, then Superintendent of the Botanic Gardens at Calcutta. Again, in 1826, we find Mr. Scott sending seeds and leaves of this indigenous tea to Dr. Wallich; and once more, in 1827, 26th July, from Gowahatty, he writes him a highly-characteristic letter, from which the following is an extract:—

"I have the pleasure to forward, by this day's dâk (post), a small box, containing seeds, said to be those of the tea plant, and which have lately been received from a chief residing on the borders of Yunan.* About a year ago, I had the pleasure of addressing you on the subject of the Assam tea plant, and, at the same time, forwarded some seeds preserved for inspection. You will probably have met with the same plant in Ava territory, where, I understand, it is in great abundance, and known by the name of *Lip-p'hip-pin*."

Now, I would particularly beg your attention to the three highly significant and important facts comprised in this brief extract. First, we have tea seeds brought from the borders of the Chinese province of Yunan, perhaps from that province itself, showing that some not very difficult road or pass from Assam into Yunan must exist, and be traversed by the native mountain tribes.† Secondly, we have a distinct and positive assurance respecting the Assam tea plant itself; and, thirdly, the tea forests of Burmah are alluded to as a circumstance well-known, and about which there could be no dispute, for he gives the very name by which the Burmese designate this indigenous tea. Let us not forget that this letter bears date July, 1827, upwards of 33 years ago.

It is, however, worthy of all remark, that Dr. Wallich, in 1823, called the attention of this estimable gentleman (Mr. D. Scott) to the value of tea culture in India, by sending him China plants, which, dying on their passage from Calcutta to Assam, were succeeded by a second despatch of Chinese seedlings, in 1824, the year in which Mr. Bruce discovered the indigenous tea of Assam. It is, of course, well-known to many members now present, that the Society of Arts very justly conferred on Mr. Bruce its gold medal, as the reward of this important discovery.‡

It is proverbial that all really great discoveries are a long time overlooked and neglected, and this instance certainly formed no exception to the rule, for some eight years after Bruce's discovery, and Mr. David Scott's labours, we find another very excellent and intelligent officer, named Captain Charlton, making strenuous efforts to revive the subject, and awaken an interest in this truly important national matter.§

It was some years after even Captain Charlton's attempts to create an interest in the indigenous tea of Assam that any systematic endeavour was made to grow and manufacture it in that country, but as I shall have occasion to refer to this endeavour again very shortly, I will say no more on the subject at this moment.

* I must express the very great respect I entertain for the opinions, however hastily formed, of such eminent botanists as Dr. Abel, Sir W. Hooker, Mr. G. Loddiges, Dr. Royle, and Dr. Falconer, but at the same time, as their opinions on this point are quite opposed to my own humble judgment and convictions I cannot honestly do otherwise than express my difference of opinion.

† A frontier province of China.

‡ The distance from Assam to Yunan is one month's march, or less, and indigenous tea is growing wild along the whole route.

§ See "Transactions of the Society of Arts," vol. 53, p. 37.

¶ The eminent services of Captain Jenkins, in the same direction, were rewarded by the Agri-Horticultural Society of India's Gold Medal.

I believe it to be an established fact that the celebrated Sir Joseph Banks was the first to recommend the experiment of growing the Chinese tea plant on the lower ranges of the Himalaya mountains; after him, Dr. Govan; and again, in 1827, the late Dr. Forbes Royle advised the

same thing in a report which he sent in to the Indian Government.

In 1832, nothing having been done in the matter by the East India Company, the late Dr. N. Wallich addressed a memorial to the Committee of the House of

FIG. III.



Thea Bohea (Variety).

Commons, earnestly recommending the cultivation of tea in the districts of Kumaon, Gurhwal, and Sirmore.

I have already mentioned that the China tea plant was, in 1823, sent by Dr. N. Wallich to Assam, from the Calcutta Botanic Gardens, and I have little doubt that he also sent it about the same time to the several points nearest to the Himalaya range. Did we not know that

those were the days of stage coaches and road-waggons in England, we might well wonder, that with an abundance of tea plants in the Calcutta Botanic Gardens, not even half an acre of experimental ground was ventured upon in the lower range of the Himalayas until the year 1836, or thirteen years after Dr. Wallich had sent plants to Mr. David Scott, in Assam. You will be able to form some faint idea

of the way they did things in those days, when I state that of 20,000 seedling plants sent by boat up the Ganges to the Himalaya station, 18,000 died by the way, and not 2,000 reached their destination alive.

Tea trees* have since that time been discovered growing wild near Sylhet, at Jynteah, in the Cossiah hills, in the Sikkim hills, and in various other localities in India.

CULTIVATION OF THE TEA PLANT.

From what has already been said, you can readily understand that the tea is a very accommodating plant, both as respects climatic range and the nature of the soil in which it is planted. We find it growing, from Pekin, which frequently has winters of Russian severity,—to Canton and Macao, where the sugar-cane and pine-apple find sufficient heat to render them sure and profitable crops. The plant seems quite capable of withstanding winters of very intense frost, provided the summers are of sufficient duration and heat to mature perfectly the newly-formed wood which it makes. Any country therefore having a long and hot summer and a cold winter can grow tea. In England the summers are too short and too cold to effect a thorough ripening of the young wood,—hence the plant cannot stand our winters, mild as they are? Hearing that some were thriving vigorously in the open grounds of the Royal Botanic gardens at Kew, I wrote to Sir W. Hooker, asking him for facts, and in reply he informed me that the tea shrubs in the open air at Kew were planted in a border under a southern wall, but even in this sheltered situation were covered up every winter, or they would be killed. But, excluding our own and similar countries, we shall have no difficulty in finding any quantity of land in every way suitable to the constitution of the plant.

As regards soils, it may be accepted as a fact, that any kind of good or medium character will answer for tea-planting; whilst it will unquestionably grow, and produce small quantities of tea, upon very poor, gravelly or sandy soils, such as few other plants could exist in at all. But although this is undoubtedly the case, yet no one must run away with the notion that it is wise, or by any means profitable, to plant tea upon very poor land,—for this shrub likes, and requires, a good, warm, generous, and moderately moist soil, as well as any other member of the vegetable kingdom; and in such a soil it yields the largest amount of good and highly-flavoured tea. A very rich or highly-manured soil is by no means desirable, inasmuch as the plant would be over-luxuriant, and yield large, coarse leaves, full of rank juices, and curing into a harsh, ill-flavoured tea. I might occupy an hour in describing the soils upon which it is principally grown in China, Japan, Java, India, and the Brazils, but there would accrue no corresponding benefit from such a wearisome detail. It is quite sufficient for me to say, that any good, or moderately good land, will suit the plant, always understanding that the Chinese varieties† cannot abide any stagnant water about their roots; hence flat, low-lying lands, very retentive of moisture, should be entirely avoided; nor will these varieties thrive well under a system of excessive irrigation, for they require only that amount of moisture in the soil necessary to their healthy development. Flat table-lands, slopes, and hill sides, which have a good natural drainage, are consequently the situation chosen for this culture; indeed, in China, tea is often planted on hill sides so steep, that the "pickers" have to be assisted by fixed ropes or chains. On the other hand, any land that is subject to be dried and parched up in the summer should be rejected, unless the plants could be continually sustained in full vigour by some cheap system of irrigation.

Tea seeds will not without great care keep good for any

* The tea plant grows into a fine large tree, upwards of 50 feet high.

† The Assam variety is by no means so sensitive in this respect.

length of time after they are gathered, therefore, they should, if possible, be sown at once, either in a seed-bed, or in the position the plants are desired to occupy in the field. In the former case, I think the best and safest plan is to sow the seed in pots set in the bed, so that, in transplanting them out into the fields, their tap-root may not be injured, for that would be fatal to them. The seedlings would also not receive that check in transplanting, nor would that operation occasion one-half the trouble and expense attendant on the seed-bed and digging-up system. But, undoubtedly, the best plan of all is to sow the seeds in the field at once, in order that the seedlings, once making roots, shall be subject to no change or check. There is seemingly a loss by this system, but, in reality, there is an actual gain, fully equal to one year in time, besides a great economy in doing away with the tedious and delicate operation of transplanting.

In very good soil, the plants are kept six feet apart, but according to the quality of the land, so will these distances vary, until, in very poor ground, we find them only three feet apart. Rows five feet apart, the plants being four feet along the rows, is a very good medium distance, each plant having 20 feet to itself, and there being 2,178 plants to the acre. Whether seedlings or seeds be planted, it is a good plan (although not necessary) to form a small bed, at least 12 inches square and 18 inches deep, at every point destined to receive the seedlings or seeds, for, by this means, the young plants attain a very vigorous growth in their early life, and thereby become larger and stronger, and better able to withstand the vicissitudes of the seasons.

When properly planted, the tea plant will continue to yield its leaves for a long period of time, varying, according to the quality of the soil, from 25 to 50 years, after which the stems may be cut down, the roots dug up, and re-planted in a fresh piece of land.

In Mr. Ball's excellent work* on the "Cultivation and Manufacture of Tea," is given, the Spanish Missionary Carpina's account of this very singular and interesting practice of the Chinese cultivators, in the part of the province where he resided, at Fogan, about 240 miles south-east of the Bohea country; and it is so curious that I cannot omit it. He says:—"With respect to the duration of the plants, in places which are suitable to them, and where animals cannot destroy them, they will last fifty years or more. When they are too old, if the soil is rich, they are cut down close to the roots, which is done at the winter solstice, and in the following spring they shoot out vigorously. But when the soil is sterile, the old roots are dug up, to be planted elsewhere. They easily take root again. It is in this manner that the shrubs are preserved and reproduced, and never by branches that are slipped off. They are also propagated by seed, but with less success, and much slower. The cultivators of tea take no pains to prevent the growth of the shrubs, for the larger they are, the more profitable; but as, in the second or third year after they have been planted or cut down, the leaves are gathered once, and afterwards three times a year, their growth is thereby checked. Yet in the plains and on the mountains, where the ground is good, they grow to a height of more than thirteen feet."

Father Carpina also mentions the fact of the Chinese cutting down the tea bushes growing wild in the mountains, and digging up the roots to transplant into their fields, as the readiest and speediest means of getting up a plantation of good, vigorous plants, which will yield the second or third year afterwards. The full value of this practice is the better understood when we compare it with the usual mode of forming a plantation, i.e., by sowing the seed, which I will now speak of.

The land being properly marked out, three, four, or even seven seeds, are placed in each hole or bed, at a depth of three to four inches, and lightly covered over, the spot being indicated by a stick being stuck into the ground. Those that germinate are suffered to remain,

* Everyone interested in this subject should possess this book.

as they are almost always thinned out by insects or other casualties; but if not, the cultivator frequently allows them to remain to form a thick bush, although this is not always the case. The young plants are carefully tended until they attain a considerable size and a vigorous growth, when John Chinaman calls upon them to furnish him with leaves, taking, however, but one light picking as a commencement, and increasing the quantity taken season after season, as the plants become older, stronger, and better able to stand these pickings.

Now, it may be three, four, five, or even six years, before the cultivator obtains even his first light picking, and this depends upon the mode of planting, character of the soil, peculiarity of climate and season, and the care bestowed upon the cultivation. From this statement it is the more readily seen, why the Chinaman lays under contribution, the roots of all the wild tea plants he can find, to commence his plantation with, rather than wait five years for plants from seed.

When the Chinaman does sow tea seeds, or plant out young seedlings in his fields, it must be observed that he generally sows other plants (annuals) between the rows, so as to obtain something from the land during the growth of his tea shrubs, always taking care not to injure these by his inter-culture.

I cannot pretend to enter more fully into the subject of cultivation here, as my time and space are so limited, but the few remarks I have made will serve to give a tolerably clear idea of the requirements of the tea plant.

MANUFACTURE, CONSUMPTION, AND ADULTERATION.

A few very brief observations upon the manufacture of tea will, I am sure, be interesting, if only to clear up in the minds of many, the question of "green v. black" teas. It is true that all I can say may be found in certain books that have been published on this subject; but, after all, how few amongst us ever see these books, or know anything about the modes of making green or black tea.

It is comparatively but very lately that even the most scientific and best informed men in Europe believed that it required the leaves of one particular variety, therefore designated "the green tea plant," to make the green tea of commerce, and those of another, the *Bohea*, to produce the black tea. The researches in China of Fortune and of Ball, together with the actual proofs furnished by the Chinese tea makers in India, have however, completely settled the truth of the matter. It is quite probable that the *Thea Viridis*, so much cultivated in the northern provinces of China, may furnish a better and brighter green tea than the *Thea Bohea*, but we cannot assert that it does so with any degree of certainty. It is, however, quite certain that both green and black tea can be made from either shrub, the result depending entirely upon the mode of manufacture; and the explanation of this difference in treating the leaves is so striking, and yet so simple, that any child can comprehend it at once. It is as follows:—

To make green tea, the leaves are picked clean, without any part of the stem or foot stalk (of the leaves) remaining attached to them. They are then taken at once to the roasting-pan (or *kuo*), and receive their first roasting. If the freshly picked leaves accumulate faster than the roaster can dispose of them, the greatest care must be taken to keep them from the action of the sun, and from heating by fermentation, in either of which cases they would turn yellow, and be spoiled for green tea making. Immediately after the first roasting, the hot leaves undergo the process of rolling, pressing, and twisting; they are then placed in basket-trays or sieves, in a cool room, until all the leaves have been once roasted and rolled. The second roasting brings them to a drier state, and to a dark olive-brown colour; and after having been again cooled in the basket-trays as before, they receive their third and last roasting, which brings out that blue-green tint (resembling the bloom on fruit), for which the

best Hyson teas are so remarkable.* (*Vide* Ball, chap. 9.) In making black tea, not only the leaves, but portions of the very young, succulent tops, and even the unopened buds are plucked; but these freshly gathered parts of the plant are not roasted at once, as in the previous case, but are exposed on trays (in layers some six inches deep), very frequently to the sun,—are tossed about until they become soft and flaccid, change colour and are spotted: showing that they have absorbed oxygen, and that their juices have undergone certain chemical transformations. They give out a peculiar fragrance, and altogether the result is somewhat analogous to the changes brought about in making hay. These leaves are then roasted, rolled, and pressed, and lastly dried on a poey over a charcoal fire. Mr. Ball gives a very concise sketch† of the whole process, in a rapid kind of summary, which I quote:—"Place the leaves in a sieve; expose them to sun and air; toss them and turn them, as hay; then place them in the shade till they give out a certain degree of fragrance; then roast them in an iron vessel; roll them with hands or feet; and finally dry them over a charcoal fire—and you will have fair Congou tea."†

Those who wish to study the whole art of manipulation practiced by the Chinese in making the various kinds of green and black teas, must have recourse to the works of Ball, Kaempfer, and others, who have entered into the subject in all its details, which certainly are most interesting.

The Chinese use several flowers, such as the Chu Lan (*Chloranthus inconspicuus*), Pac Sheem (*Gardenia florida*), Kuey-Hoa (*Olea fragrans*), and the Moo-Ly-Hoa (*Jasminum Sambac*), for scenting their teas; and the whitish powder, so frequently noticed amongst some of the green and black teas, is often nothing but that of the Chu Lan flower.

In England we think that we are paying pretty high prices when we give 4s. 6d. per lb. for black, and 5s. 6d. for green tea; and, considering the nature and composition of the articles we get, perhaps we are justified in grumbling; but it is refreshing to know that if the Russians do really get the good tea, of which they boast, they at least pay tolerably exorbitant prices for it; in some cases as high as 50s. sterling per pound. If this be an almost incredible price to pay for tea in Russia, what will be thought of the same price (50s. per pound) being paid by the princes and superior mandarins of China, for tea made in their very neighbourhoods? Yet this is absolutely true, and serves to show us how very highly the best teas of China are prized by her own people, who undoubtedly possess a delicate and refined taste for tea, such as we can scarcely comprehend.

When I was living in the Straits Settlements (Malacca), I have had presents, made me by rich Chinamen, of small packets of Mandarin tea, which no European can obtain by purchase; and I must say that it was the most delightful I can ever hope to taste; and in those days I drank tea in Chinese fashion, without milk or sugar. Nevertheless, I am free to confess that I should decidedly object to pay 50s. a pound for such tea, although it was much superior to any the Russians obtain.

The vast bulk of the tea made in China is undoubtedly of very middling or even inferior quality, whilst there is also an immense quantity of very poor stuff indeed, part which is used by the very poorest classes of Chinese, and the remainder for mixing with better teas, for European consumption.

We have no very certain means of estimating the exact quantity of tea consumed in China, but we may nevertheless draw conclusions from such data as we possess. Taking

* The Chinese also "get up" adulterated teas, in imitation of this natural bloom.

† Page 141.

† Bruce, on Assam tea, writes in 1840:—I am now plucking leaves for both black and green tea, from the same tract and from the same plants; the difference lies in the manufacture, and nothing else.

the population of the country, then, at 400 millions, and considering that the use of tea is universal amongst them; that they drink it from early morning until they retire for the night; that in sickness or health, working or resting, travelling or at home, it is the one great national beverage, without which no Chinese family could live and thrive; considering all this, I think I am not over-rating it when I set it down at an average of 5 lbs. a head per annum, or a total of 2,000,000,000 of lbs.! Now if we allow 100 lbs. of cured tea as the average produce per acre in China, this will show a cultivation of 20,000,000 acres in tea alone, whereas I am more inclined to estimate it at 25 million acres. Just let us compare this with other cultures in other countries. France, which is not larger than one of the Chinese provinces, and contains less than one-twelfth the population of China, has, nevertheless, five million acres in vines. The Southern States of America have seven million acres in cotton, cultivated by less than one and a half million of negroes; and India, with only half the population of China, has 14 million acres in cotton. These comparisons are quite sufficient I think to prove that there is no improbability attached to the estimate I have given of the extent of land devoted to tea culture in China; I therefore leave out of the question the area occupied in different countries by such crops as rice, wheat, &c.

If we allow that the internal consumption of tea in China amounts to 2,000 millions of pounds, we cannot but be struck with the comparatively small quantity she exports; for according to the latest statistics, we find that her total export of tea to all countries, does not reach 200,000,000 lbs., being less than one-tenth of her own consumption. Of this quantity the United Kingdom took about 78 million lbs. in 1860, her consumption being about 79 million lbs.

Going back 30 years, we note the gradual increase of consumption in Great Britain and Ireland, viz. :—

In 1820	22,452,050
1830	30,047,079
1840	32,252,628
1850	51,172,302
1859	76,328,131*

and although we have no official return for 1860 as yet, I assume the consumption to have been about 79 million lbs., or less than the twenty-fifth part of the quantity consumed in China. I should be much pleased if I could say that the tea consumed in this country is pure and unadulterated; unhappily, I am compelled to present to your view a picture the very reverse of this.

From time immemorial, the Chinese have been in the habit, more or less, of adulterating their teas, but, until a very recent period, those teas were consumed at home, and seldom, if ever sold to Europeans.† They, however, observed that the European dealers residing in Chinese ports practised this little "art and mystery" themselves, upon almost all the teas they bought, previous to shipping them. Now "John Chinaman," who is an observing and highly imitative animal, seeing this interesting and lucrative business, transacted so extensively under his very nose, and that, too, from month to month, and year to year, began to take counsel with himself, and speedily arrived at the conclusion, that he was a great fool for surrendering this very pretty "pigeon"‡ to such bungling "foreign devils."

We shall be in a position to appreciate the zeal with which our celestial friends set about remedying this poaching upon their own domain, when we find, that, in 1859, of the tea purchased by dealers in China, seven-eighths was adulterated. The fact is, "John Chinaman" had "improved the occasion," and entirely taken this

little "pigeon" out of the European trader's hands, by selling him teas, largely adulterated it is true, but certainly most artistically got up. It mattered not whether the teas were purchased in Canton or in the northern ports, the beautiful ingenuity of the Chinaman was as apparent in the one as in the other; and our circumvented traders groaned aloud. What was to be done? No one could tell; so they called a "meeting," to consider the subject, and, on the 18th of April last, they met and compared notes. The immense quantity of "lie" tea, prepared for admixture by the Chinese, was mentioned; the cargoes of unsound leaf, brought from Japan, to be "doctored" and mixed with other tea, were enumerated; and an interesting account was given of three plants, the leaves of which are largely employed in adulterating teas. These are, *Gynura auriculata*, a drug which is stimulant and slightly acid, *Ardisia crispa*, and a common mint. The meeting came to the doleful and indignant conclusion, that seven-eighths of the tea they purchased was grievously adulterated, and that "John Chinaman" was a great rogue.

But in good truth this is no joke, especially when we consider that these 76 millions of lbs. (7ths of which is adulterated), has yet to pass through the hands of our own manipulating dealers. What it undergoes during this perilous ordeal we can only guess at, although the reports of the excise officers, and the cases in the several magistrates' courts, give us a faint idea of the nefarious practices resorted to. It was but a week or two ago that upwards of 2,000 lbs. weight of pure English "lie" tea, was seized by the officers, who admiringly pronounced it to be "splendidly got up, and calculated to deceive the eye of anyone." When this "manufactory" was entered by the officers, its enterprising proprietors were doing extensive business in supplying their home-made "article" to the trade. Now, what with the "lie" tea of China and the "lie" tea of England, many begin to regard the tea of our shops, as being a huge "lie" altogether. For myself, I cling to the comforting assurance that the Chinese do sell us one-eighth (of the whole quantity), or 9½ million lbs. unadulterated, and I try to believe that this is not tampered with in any way, but comes to us pure and wholesome. Those who deal with tea merchants of high character will have no difficulty in joining me in this belief. Who is it, then, that suffers from these double frauds? It is the million. And the lower the class, the greater are the impositions we see practised upon them; until we cannot but repeat that exclamation, which, in very bitterness of spirit, a good and tender-hearted man gave vent to, "God help the poor!"

This Society, so practical in its purposes, so beneficent in its labours, and so potent for good, may it not legitimately afford its aid in securing to the millions of our country pure and wholesome articles of food? A legislative enactment has recently been passed against the adulteration of articles used as food, but we want the country to be roused from one end to the other, on this great domestic evil, so that it may be effectually put down. But whilst looking to this legislative enactment, let us not lose sight of what we may ourselves do towards remedying the evil complained of in the matter of tea. We want a very abundant supply of good pure, wholesome, and cheap tea; and we can get it if we only make up of our minds to attempt it. To prove this we must leave Chinese ground, and take a view of other

TEA-PRODUCING COUNTRIES.

As the cultivation of tea involves considerations of a f. s. d. character, it is necessary to show what an acre of tea plants will yield per annum under favourable circumstances, and when arrived at full bearing.

From 200 to 300 lbs. of cured tea is by no means an uncommon return from one acre of land, which at the present average price of 2s. per lb. would exhibit a money value of from £20 to £30; certainly a very valuable crop. As I have shown, the tea plant is exceedingly hardy, and the manufacture of its leaves, by no means a difficult or

* It is quite worthy of remark that the quantity of coffee consumed is just one-half that of tea.

† Although the East India Company, in their day, purchased little but tea of second and third quality, yet their buyers took care that all they bought was pure and genuine.

‡ Canton-English for "business."

expensive process. Little or no capital is necessary for buildings or utensils, and the worst that can be said against it is, that the planter has to wait four or five years before he can begin to pick his leaves. On the other hand, once in bearing, his shrubs will last a life-time or longer, requiring little culture, and but little manuring.* The two continents of America† afford a vast field for this culture, could cheap labour be depended upon there, Brazil being the only portion of it in which it is now cultivated.‡ Madeira, Tenerife, Portugal, Spain, France, Algeria, Italy, Austria, Turkey, and the Crimea, might all grow tea, for their climates are quite suitable; Australia, Tasmania, and New Zealand are admirably adapted likewise, but they have little or no labour to bestow on such a cultivation. Java has long taken up tea culture, and produces some millions of lbs. But the country to which I wish to direct especial attention is our own glorious India. Glorious, indeed, she would be to us, if we only availed ourselves of her vast productive resources—resources which would supply our manufactures with raw materials in profusion—which would rejoice the hearts and stomachs of our hard-working people—which would enrich her own teeming population—which would cover her rivers with steam-boats, and her land with railways—which would make her peaceful, happy, and contented, and which would confer on England an enduring blessing. I have already said that the tea plant is indigenous in several parts of India, but the localities in which it may be profitably cultivated in that country, are more numerous than I should like to state, but amongst the many I may safely mention Assam, Sylhet, Cherra Ponjee, Darjeeling, and the Sikkim hills, Kumaon and Gurhwal, Nynee Tal, Deyrah Dhoon, Kangra Valley, and other parts of the Punjab, and Cashmere;—the table-land of Omerkantak (in Central India), and the Neilgherries, Coorg, and Travancore (in the Madras Presidency). It has also been grown, and I believe would admirably succeed, at Palamow, Chota Nagpore, Hazareebaugh, Burdwan, and the Blue mountain in Chittagong. Now, in all conscience, here is space enough to grow tea to supply the whole world, and the cheapness of labour would enable the Indian tea-planter to undersell even the Chinese, who now command the markets of the world.§

In consequence of the discovery of indigenous tea in Assam, the Bengal government commenced some experimental plantations at Seobsangur, and other points, in the year 1835, and they came under the superintendence of Mr. Bruce, who first discovered the plant in Assam, and some years afterwards of Mr. J. W. Masters. Of all the localities for tea in Assam, Mr. Masters gave a decided preference to Satsoeah, and emphatically pronounced it to be

* Four lbs. of fresh leaves will cure into one lb. of tea.

† In the Transactions of the American Institute, 1856, is the following:—"In the year 1846, a valued member of this Institute, Junius Smith, having an intelligent daughter resident in India, employed her to obtain tea plants and tea nuts for him. She succeeded, and he commenced the formation of a tea plantation in the Uplands of South Carolina. He prepared a valuable paper on tea, which was published in our volume of Transactions of 1847. Dr. Smith received no encouragement. His little plantation was flourishing, when he was assailed by some wretches there; he was attacked, came back to New York, and soon died of the wounds he had received." The fact was, that his low white neighbours, being in the habit of walking into his plantation whenever they pleased, and taking away his tea plants, caused him to remonstrate with them, and to put up a fence, upon which these aggrieved gentry waylaid and shot him down!

‡ This culture was first commenced, and Chinese introduced into Brazil in 1810; then again in 1817; and there is now a very large extent of land devoted to it, and quantities of tea made, principally in the high lands of St. Paul's and of Santa Catharina.

§ It is estimated by the most competent authorities, that the Chinese cannot sell good, pure teas, under 10d. to 11d. per lb., whereas India might produce it at from 4d. to 6d. per lb., when more extensively cultivated; and Java at 8d.

the most valuable tea locality known. These plantations were afterwards sold (in 1839) to the Assam Tea Company, who, after floundering about for a long time, at length got under good and able management, and can now boast of some 4,000 acres of land under culture, yielding somewhat less than 1,000,000 lbs. of tea last season. Their tea sells in the English market at from 9d. to 4s. per lb., but averaging all round 2s. per lb. The character of this tea is strong, coarse, harsh, and astringent; qualities which render it very valuable here for mixing with the poor, flavourless rubbish, which is imported so largely from China; hence, Assam tea is in great demand, and commands higher rates than even the best Chinese. The Assam Tea Company, then, is a great success, paying, according to report, upwards of 15 per cent. upon the capital invested. I am sorry that I cannot be more certain on this point, but it strikes me that this Company is so very successful, that they do not desire any interlopers to jostle them in Assam, hence they refuse to afford any information as to their operations or financial position.

There has been another company recently formed, named "The Jorehaut Tea Company," Seeb Saugor District, Upper Assam, but being a private company, the public are not admitted to their confidence. There are also several individuals cultivating tea in Assam.

The chief difficulty complained of in Assam, is the want of sufficient labour, but how this can be, when Coolies are taken to the Mauritius, I cannot comprehend. Another disadvantage of Assam is the long and tedious water carriage to and from Calcutta; so that upon the whole, I do not think the Assam Company need alarm themselves as to strangers selecting Upper Assam as the scene of their intended tea operations. I can hardly imagine any prudent man passing so desirable and healthy a locality as the hills in the neighbourhood of Sylhet and of Jynteah (where tea abounds in a wild state), to settle in so unhealthy and so distant a place as Assam.

But the operations which are deserving of our most earnest attention, are those, which the Indian Government has been for so many years carrying on, in the North Western Provinces, under the able and judicious management of Dr. W. Jameson. These experiments commenced in 1855-6, and have gone on gradually extending until they have now assumed very imposing dimensions.

In 1859, these tea plantations consisted of—

In the Kangra Valley	800 acres, and 2 factories
" Deyrah Dhoon	400 " " 1 "
" East Gurhwal (Poorie)	350 " " 1 "
" Kumaon	700 " " 3 "
<hr/>	
Total.....	2,250 " " 7 "

The Bohea variety is that principally cultivated on these plantations, although there are some of the Assam variety here and there intermixed.

Government established these experimental plantations, with a view of testing the suitability of these several localities,—of demonstrating the profitable character of such a culture in that part of India,—and of inducing both Europeans and natives to adopt it. In this object, Government has certainly had considerable success, for, according to Dr. Jameson, there were, in 1859—"In the Kangra Valley (Punjab), one European, a Mr. Berkeley, and about 100 natives, cultivating the tea-plant on their own account. In the Pinjora Valley, the Rajah of Patialah has commenced a plantation, and to these parties upwards of 20,000 plants and 21,840 lbs. of seeds have been distributed this season.

" In the Deyrah Dhoon the following parties are now cultivating tea:—

1. Col. Elwell.	5. Gen. Dick.
2. Maj. Thelwall.	6. Gen. Swetenham.
3. Maj. Thomas.	7. Maj. Rind.
4. Gen. Wilkinson.	8. Capt. Murray.

9. Mr. Todd.	16. Mohun Sing.
10. Gen. Vincent.	17. Parutam Dass.
11. Gen. Hoggan.	18. Nand Lall.
12. Mr. Troup.	19. Buctawa Sing.
13. Mr. Hawkesworth.	20. Nuneyah Lall.
14. Rajah Lall Sing.	21. Surup Doss.
15. Ram Nath.	

to whom upwards of 80,000 seedlings and 25,200 lbs. of seeds have been this season distributed. The tea planters in Gurhwal and in Kumaon are :—

1. Mr. Richards.	6. Mr. McIver.
2. Capt. Cumberland.	7. Mr. Warrant.
3. Juggut Ram.	8. Syce Ram.
4. Mr. Wheeler.	9. Dowlut Sing.
5. Mr. Lyall.	

to whom upwards of 80,000 seedlings and 25,200 lbs. of seeds have been given. In addition to these, 14,280 lbs. of seeds have been sent to Darjeeling, to parties cultivating tea there. It will thus be seen, that during the season (1859) there have been distributed gratis, from the Government plantations, to private individuals cultivating tea, upwards of 36½ tons of tea seeds, and 1,800,000 young tea plants. One planter in the Dhoon produced, this (1859) season, 8,000 lbs. of tea, which was prepared by natives trained in the Government factories, whilst another planter in Kumaon produced about 500 lbs.; these teas realising here 11s. 9d. per lb."

It must be acknowledged, that Government has acted most liberally in supplying plants and seeds to those who have embarked in this culture, and whoever will read the note appended to this* will see that in respect to making grants of suitable land the Government regulations are extremely liberal also.

No one need be under any apprehension that all the suitable lands will be immediately occupied in this particular part of India, as the following report by Dr. Jameson will shew. Lands adapted for tea culture :—

	Acres.
In Kumaon	350,000
Eastern Gurhwal	180,000
Western Gurhwal	180,000
Deyrah Dhoon	100,000
Tounsar Bawar	10,000
Kooloo and protected Hill States ...	230,000
Kangra Valley	30,000

Total 1,080,000

Which, if stocked with tea plants, would even at the low average rate of 100 lbs. per acre, annually produce 108 million lbs. of tea. This would be some 30 million lbs. more than the annual consumption of the United Kingdom.† After all, this area is really a very small portion of the lands which might be obtained by the tea-planter, as I will presently shew. The cultivation at the Government plantations has been an enormous success. They contained (February, 1859) upwards of 16,000,000 of

* Government grants of land in Kumaon and Gurhwal for tea culture—from 200 to 2,000 acres to each person—on following terms and conditions:—Lease for 20 years; first four years, free; fifth year, one anna (1½d.) per acre; sixth year, two annas; seventh year, three annas, and so on, adding one anna every year, until the twentieth and last year the maximum of one rupee is reached. At close of fifth year, one-twentieth part of the land to be cleared and planted in tea; at close of tenth year, one-fifth; close of fifteenth year, half; and at close of twentieth year, three-fourths of said area to be cleared and well-stocked with tea plants. In failure of said conditions, "grant" forfeited, and liable to be taken away. Government guaranteeing to supply plants and seeds gratis to applicants so long as Government tea plantations are maintained. (Vide "Dr. Jameson's Report," 1859.)

† From the report of Major Lake (the Commissioner and Superintendent of the Trans-sutlej states) it is evident that in the Kangra hill district there are waste lands fitted for tea, amounting to 1,157,382 acres; which are all available to applicants.

tea plants, all in the most flourishing condition, and yielding large quantities of excellent tea, which sells readily on the spot at 4s. per lb. Full-bearing shrubs (Dr. Jameson states) yield 300 lbs. of cured tea per acre, and younger plants in like proportion; but the average of a whole plantation in full bearing may be calculated only at about 200 lbs. per acre. Mr. Davies, Secretary to the Government of the Punjab and its dependencies, writing from Lahore, on the 11th of June, 1859, to the Government of India, says of the Kangra "Valley plantation":—"It now occupies 800 acres, bearing some five million plants. It is estimated that the produce this year will amount to 26,000 lbs. of excellent tea, valued at £5,200, and that when in full bearing, the yield will increase to so large an amount as 150,000 lbs. The expenses are computed at £1,600 per annum—there is, therefore, a very considerable profit; besides which, vast quantities of seedlings and seeds are distributed gratis, &c."

Dr. Jameson, in his report to Government, July 20th, 1859, says:—"The Deyrah Dhoon and Kangra plantations, (containing together 1,200 acres in tea shrubs) will this season yield 70,000 lbs. of tea, which, at the market rate, may be estimated at £14,000, whilst the expense of working them may be set down, at the very outside, at £4,000, which will leave a clear profit of £10,000. This will be largely increased next year, when these plantations may be expected to produce 100,000 lbs. of tea." It must be observed that these two plantations were expected to yield a clear profit of £10,000 on the crop of 1859, although they have not nearly arrived at perfection; the great proportion of their shrubs being at that time only very young. Nothing can possibly serve more clearly to demonstrate the profitable character of this simple and inexpensive cultivation, than these plain, straightforward, official reports of Dr. Jameson; and I take this opportunity of returning my grateful thanks to my kind friend Dr. Forbes Watson, of the India House, for lending me these important documents, and the splendid map now on the wall. The production of tea having thus been incontestably proved to be a great success in the northwest of India, the Government contemplate disposing of all these valuable plantations, except one, which it is proposed by Dr. Jameson to retain, in order that the "grant holders" and native cultivators may still be supplied by government with seeds and seedlings; but the Governor-General has very sagaciously requested Dr. Jameson to consider well whether one single plantation will be sufficient to supply the demand for seed and seedlings; and I do sincerely hope that Dr. Jameson will, upon reflection, recommend government to retain two plantations at least.

Past and present experience teaches us that companies do not like anything in the shape of competition, especially in their own immediate neighbourhood; and I am thoroughly convinced that they would use the tea-seeds for manure, or burn them, rather than supply them to persons wishing to cultivate tea in their part of the country. The public at large and the Government may look at such a matter as a great national object, but a "company" views it as a matter of private interest, far too sacred to be interfered with. Let us hope, then, that the Governor-General's suggestion will be acted upon, and that two of these very profitable plantations will be held in hand by Government, to promote the extension of tea culture. Previous to any of them being sold, they are to be extensively advertised in the newspapers, that the public may have an opportunity of competing for their purchase. This is as it should be.

I must not omit to mention that tea culture in the Himalaya is a very healthful and enjoyable occupation, for with a manager or overseer on the plantation, the proprietor and his family may reside in some delightful locality, like "Nynee Tal," that lovely mountain lake which has been aptly designated "the gem of the Himalayas." Here, in the most desirable society, he and his may enjoy the pleasures of boating, fishing, shooting, and hunting, as well as all the manly games peculiar to Old

England, whilst his children retain the rosy cheeks of Europe, and may procure an excellent education at the schools that have been established at this charming retreat. And lastly, though by no means the least important consideration, for many years to come prices will be obtained for Himalaya teas on the spot, nearly double those afforded by the British markets. This arises from the enormous internal consumption that is gradually and surely being established; indeed, no one can tell to what wonderful extent this may yet reach, but I am firmly convinced that tea is destined to become, at no distant day, the great national beverage of India.

In the Neelgherrie mountains (on the South West coast) tea seems to flourish quite as well as in the North West Provinces; likewise at Koonoor, at Coorg, and at Travancore; in all which places Dr. Cleghorn tells us it succeeds perfectly. There are no doubt millions of acres in these countries, as suitable to its growth as the Himalayan localities we have just been discussing, so we see that India may yet rival China both in the quantity and in the quality of her teas. There is but one country more to which I would direct especial attention in respect to the production of tea, and that is our beautiful and salubrious colony of Natal.

At first sight it appears improbable that it can be grown and manufactured there at a profit, but a practical knowledge of the colony induces me to believe that, a company could establish a five-thousand acre plantation there, more speedily, more cheaply, and more advantageously, than in any other country. Every acre could be prepared by steam-power; every acre could be "hoed and cleaned" by steam, until the trees began to furnish leaves for picking; and I believe that every ounce of leaf could be manufactured into good and valuable black teas by the most simple and inexpensive machinery. The only apparent difficulty would be in obtaining an adequate supply of seeds and plants; but in reality this could easily be overcome, and at no great expense, as tea shrubs abound in the Mauritius and in Bourbon, from which quantities of seed might be obtained; or they might be brought from China direct, by ship-loads, if packed in a peculiar manner, so as to preserve their germinating power. From her own possessions, therefore, England might obtain all the tea she can consume, and that, too, of a pure and thoroughly wholesome quality, instead of sending to China so many millions sterling of silver to purchase an adulterated and dishonest article.

British capitalists will subscribe any amount of money to construct railways or anything else in the United States, the Brazils, or other foreign country, which may to-morrow repudiate them and their claims; but here, in our own India, a safe and profitable investment may be made of many millions sterling. Let our monied men look, then, to this abundant source of wealth, from which they themselves may derive very large dividends, whilst their fructifying capital is, at the same time, conferring manifold benefits upon India and upon their own native land.

DISCUSSION.

The CHAIRMAN said the interesting paper they had just heard was well worthy of their attention, and he hoped that many present who, like himself, were acquainted with countries where tea was produced and with the tea trade, would make some remarks. His own personal experience confirmed a great deal they had heard that evening, and he should be happy to have the views of those present upon this interesting subject.

Mr. T. A. MALONE in allusion to the description given in the paper of the mode of drinking tea in China without either milk or sugar, begged to inquire whether it was taken as a strong infusion or the reverse. In the recent interesting accounts from China, he had read that tea was presented to our countrymen negotiating there, which was described as being very weak and particularly disagreeable to the taste. It would therefore be interesting to know

what was the general custom of the Chinese in this matter. From what was stated in the paper with regard to the extent to which that article was adulterated, he thought they would rather be driven back to Sir John Barleycorn, and would prefer the malt tax to drinking such a compound as it was alleged they now got under the designation of tea. While on this subject he would mention a fact, that had recently come under his notice from undoubted authority. He had had put into his hand a substance which he was told was extensively used in the adulteration of tea. It was a substance called *Valonia*, and was said to be the cup of the acorn of a foreign oak. It contained a large quantity of tannin or astringent matter. People generally preferred full-flavoured tea, and it was said that much of the adulteration was due to that circumstance. The flavour so much approved could, he believed, be imparted by the admixture of certain astringent materials; and if it were generally known that it was by this means the full rough flavour was imparted to tea, it might tend in a great degree to alter the public taste in that respect; for he believed until they succeeded in acting upon public opinion, they should do very little good in these matters. He would mention, with regard to the transporting of the tea plants, that under the old method employed for that purpose, the majority of the plants died off before reaching their destination; but there would be no difficulty in transmitting the plants to Natal or elsewhere in Ward's cases; and those who had used them found that only a small per centage of the plants were lost.

Mr. ROBERT DAWBARN was anxious to learn whether any ready test could be applied for the detection of the alleged adulteration of tea. He did not refer so much to the adulteration in this country as to the original adulteration in China. If any gentleman present could inform them as to a good test for the detection of the original adulteration, it would be a great practical benefit. It was certainly a fearful thing to contemplate the extensive adulteration of an article which entered so largely into our domestic consumption. He was willing to think there had been some little exaggeration or error on that subject. Mr. Wray had stated that the proportion of green tea used in this country was only as 1 lb. to 50 lbs. of black tea. If that were the case, it was very different from what it used to be.

Mr. WRAY said, taking the average throughout England, 50 lbs. of black tea were used to 1 lb. of green.*

Mr. DAWBARN added that the general reputation of the tea market at the present time was that more good tea was now brought in than was formerly the case. The great argument against the progressive duties upon the importation of tea was that there were no means of distinguishing between the different sorts, but in practice this difficulty had been solved. He could state that in the Eastern Counties a much larger proportion of green tea than that stated by Mr. Wray was used. There was nothing that respectable merchants and traders detested so much as adulteration; but with regard to tea he was afraid the fact was too strong to be denied, and the great object was to ascertain some simple test by which it might be detected. In districts of the country where the water was soft, he believed there was not that desire for the rough-flavoured teas which had been alluded to by the last speaker.

Mr. H. C. WHITE believed the statement that seven-eighths of the tea brought into England was adulterated to be a great exaggeration. Large quantities of tea passed

* According to the Customs Returns for 1860, it appears that the importation of tea was as follows:—

lbs.

Black 81,636,000

Green 10,064,000

and the delivery for consumption was—

Black 75,457,000

Green 10,743,000

—ED. J. S. A.

through his hands annually, and he could state, as the result of an extensive practical experience, that adulterated tea was the exception, and not the rule. With regard to the relative proportions of black and green teas consumed in this country, he believed one-tenth to be nearer the fact than one-fiftieth. He thought it was a pity that it should go forth that there was such an amount of adulteration of tea as had been stated by Mr. Wray. He was sure there was nothing like that extent of adulteration in tea, and he repeated that spurious tea from China was quite an exception. The last speaker had expressed a great anxiety to discover a test for the adulteration of tea. He (Mr. White) would say, the most infallible test in such cases was the public palate. People for the most part knew what good tea was. Mr. Wray had commiserated the poor, who he said drank the worst descriptions of tea, but he (Mr. White) must be permitted to say that the poor were the best judges of tea; and in the poorest neighbourhoods good tea could be obtained if a proper price were paid for it, and with very little, if any, adulteration. There was a great tendency in the present day to exaggerate these matters, and to find out cases of adulteration, to which a high colouring was given; but he repeated that his own experience had been that spurious tea was the exception, and when met with it was cast aside as being almost worthless.

Mr. JAMES LEONARD begged to offer his individual thanks to the gentleman who had in so able a manner brought before them that evening the interesting subject of the production of tea. For many years, dating from 1839, he had taken a great interest in this subject, and it had been a delight to him to hear many of the facts this evening, the data for which had, in a great measure passed through his own hands at the period to which he referred. It so happened that the whole of the correspondence of Mr. Bruce passed through his hands at that time, and he was able to lay on the table a condensed abstract of these letters which gave rise to the formation of the Assam Tea Company. The late Mr. Sheriff Rogers took a great interest in this matter, and it was that gentleman whom he addressed in a pamphlet on this subject, and it had given him much pleasure to hear, through Mr. Wray, this evening, a confirmation of the opinion he was then able to form of the great chances of success that were likely to attend the formation of such a company upon the invaluable information that was furnished in the letters of Mr. Bruce. How they had met with success Mr. Wray had informed them, and there was no doubt whatever that excellent tea could be produced in our own dominions, if there were hands enough to cultivate and manufacture it. There had been a great deal of enterprise shown in this matter, and the Government had come forward and ably supported it; but there was still room for a very large employment of capital in this direction. With regard to the question of adulteration he could say, from his connection with some of the first tea houses in China, that they could only hope to prevent the importation of spurious teas, by trusting to the honour of the gentlemen who there made the purchases. He was certain that what Mr. Wray had mentioned as to the meeting held last April, was a guarantee to this country that our friends in China were wide awake to the necessity of sending good teas to this country; and he was very certain that when the matter was properly ventilated, as it would be in such a meeting as the present, and went before the country, they would be cheered on to continue their efforts to supply the home market with good teas. With regard to the success of the Assam Tea Company, it was gratifying to know that the opinion which was formed of the enterprise in 1839 was a correct one. He saw himself surrounded by gentlemen largely involved in the question of the purity of teas, and although they might not be able altogether to avoid adulteration, he believed the energies of their merchants would never flag in endeavouring to supply the country with an excellent article.

Dr. FORBES WATSON remarked that he was sure there could be only one sentiment of indebtedness to Mr. Wray for having so well brought forward this subject. No doubt in dealing with such a matter as this they might pick out some things to object to, but the subject itself was one of vast national importance. Personally he expressed his thanks to Mr. Wray for the excellent way in which he had handled the materials which he (Dr. Watson) had felt it no less a pleasure than a duty to place at that gentleman's disposal for the purposes of this paper. The national importance of the subject might be gathered from statistical facts indicating the rapid increase in the quantity of tea consumed by the people of this country. Twenty years ago, they found that the average quantity per head of population in England was 1 lb. 6 oz.; last year, assuming that 80,000,000 lbs. were consumed in this country, and taking the population at 30,000,000, the quantity was represented by the amount of 2 lbs. 10 ozs. per head, or nearly double what it was twenty years ago. Seeing, therefore, that twenty years ago the middle and upper classes drank about the same quantity of tea as at present, it followed that the lower classes were beginning to drink more largely of tea, and therefore Mr. Wray was warranted in looking out for sources of good, wholesome tea for them. One word upon the subject of the antiquity of tea. He was disposed to differ from the notion that tea was drunk by the Chinese thousands of years before the building of the great pyramids, inasmuch as it was even doubtful whether that people then existed. With regard to the *vezata quaestio* of "species" or "variety," he was not going to discuss it, but would look at the question merely practically. The tea plant was found in Assam, but the question was, whether the plant growing in Assam would furnish the article which was so much required in this country. The answer to that was that it would not. It was true they had a tea which answered well for the purposes of admixture with other qualities, but he doubted whether Mr. Wray, or his friend who spoke last, would like to be compelled to drink Assam tea alone. But still it was of importance to know that they had districts in their own territories in which a tea plant did flourish, because it might be presumed that the plant which furnished the tea they all liked would grow there also. Now, it was not the indigenous plant of Assam which they had transferred to the northern parts of India, and which was now cultivated in the government plantations to the extent of 2,000 acres, but the tea plant from China, which the enterprise of government had taken from that country and planted in India. One word as to the question of what they wanted in India, with regard to tea. They wanted the private enterprise and capital of England to be brought to bear upon the matter. Those plantations in India were about to be put up for sale, and it was to be hoped that the attention of capitalists in this country would be directed towards them. There were certain conditions attached to the sale of those plantations, which were indicated in a note by Mr. Wray.* These were considered by the Government essential to secure the extension of the cultivation of tea generally throughout India; and it was not desirable that any one large company should secure a monopoly, but they wished to have several large companies—and certainly the field was sufficiently extensive to afford room for all. It would take a capital of about £600,000 to develop fully the portions of India which furnished the soil and climate adapted to the cultivation of tea. He looked forward with interest to other speakers taking up the question of adulteration further. One gentleman had doubted the assertion that the adulteration was carried to the extent alleged by Mr. Wray. It was a matter of importance that that question should be ventilated. Mr. Wray had made certain statements; but the expression of opinion on the other side was one which demanded respect. They

* See note at p. 146.

were, however, in want of downright facts upon the subject, and it was important that they should get them.

Professor BENTLEY could not allow this interesting subject to pass over without offering one or two remarks upon it. In the first place, with regard to the botanical portion of the subject, it was not necessary to make more than a passing remark. In his own mind there was no question as to the three so called species being merely varieties of the same plant. Some years ago a fact came under his notice which bore out that idea. He had some seed of the *Thea Bohea* sent him, which he planted under different circumstances. The plants that came up were quite as different in character, appearance, and habit coming from the same seed as the other varieties enumerated. He begged to take exception to one statement made by Mr. Wray—that was as to tea being indigenous throughout the wide area of country he had mentioned. As far as botanists were concerned, he did not think they would admit that tea was indigenous in all those districts. So far as he knew, the tea plant was only indigenous, strictly speaking, in Assam and certain parts of India, and was not indigenous in China at all as far as had yet been shown. But that was a country not yet explored, and it might be proved that tea was an indigenous plant there, but at present they could not take it for granted that it was so. Upon the subject of the production of tea, he quite agreed with Mr. Wray as to the immense extent of land under tea cultivation in China. His estimate of the number of acres even exceeded that of Mr. Wray. The consumption of tea throughout the whole world might be computed at 3,000 millions of pounds. Mr. Wray had estimated the number of acres under tea cultivation in China at 20 millions, and had given the average produce per acre at 100 lbs. of dried tea. He (Prof. Bentley) was inclined to think that from 200 to 300 lbs. per acre was nearer the quantity. Seeing that the common price of tea in China was from 8d. to 9d. per lb., a yield of only 100 lbs. per acre would not pay the cultivator. He now came to the next important part of the subject, namely, the adulteration. He confessed he was quite startled when he heard from Mr. Wray that he believed seven-eighths of the tea imported into this country at the present time was adulterated. He could not venture to deny that statement, because his experience did not enable him to do so; but he had made some investigation into the subject, and he must say, as far as his own inquiries had gone, he found upon the whole that, within the last few years, tea was amongst the least adulterated of any articles imported from foreign countries, and therefore he was inclined to think that this statement was an exaggeration, and the more correct figure would be to say one-eighth was adulterated. He wished to have this subject investigated in a fair way, and that every fact bearing upon it should be proved, otherwise the ventilation of it would do more harm than good. With regard to adulteration with such a substance as *Valonia*, he thought such an admixture, if it ever occurred, must have arisen from accident, and not from design.

Dr. LANKESTER, F.R.S., begged to say one word upon this interesting subject. He was struck with Mr. Wray's remarks upon the species of the tea plant, and as that was a subject which was interesting to the scientific world just now, he must say that, after all, they must not be led away with the idea that the mere resemblance between two things established their identity of species. Permanent characters were essential in order to constitute a true characteristic of species. An illustration of this was afforded in the apple and pear of this country. If those trees did not bear fruit, there would be no evident specific difference between them; but the fruit of each partook of a distinctive character, which was never lost. So it was with the tea plant. Some of the products were so different from the generality, especially those of Assam, that he thought they were justified in regarding the Assam tea plant as a distinct species. With regard to the transmission of this plant to different parts of the world, it had borne trans-

portation into districts widely differing from each other. Mr. Wray had recommended experiments in the cultivation of tea in Natal. He (Dr. Lankester) thought that would be a dangerous speculation, and he merely threw out the hint in case persons should attempt it upon insufficient consideration of the subject. There was not only the uncertainty whether the plant would succeed, but there was also the difficulty of getting the labour to apply to its cultivation. That had been the great drawback against the cultivation of cotton in that colony. With regard to adulteration, there could be no doubt it often occurred, but he did not know on what grounds Mr. Wray had placed the extent of the adulterated commodity at seven-eighths of the entire quantity imported into this country. He might mean that inferior kinds of tea were substituted for better kinds. There was no doubt, however, that besides this, injurious substances were sometimes added to the tea as means of adulteration. At any rate there were enough substances brought in the tea from China, as well as added in this country, to awaken public suspicion, and in this matter we must not always be guided by the respectability of the dealers. If they would not take the trouble to acquaint themselves with the nature of the adulterations, they must have to hear these charges made against them. Within the last fortnight, he had sent to a great warehouse in London for an article, expecting to get it genuine, in order to demonstrate what was genuine as compared with what was adulterated; but it so happened that the article he then procured, afforded the best specimen he could have of adulteration. He went to the head of the firm, and pointed out the fact to him; but he could not make him understand the nature of the adulteration, and he was quite ignorant of the chemical changes that had taken place, and so long as that state of things continued on the part of the traders, so long would they be open to public distrust with regard to the articles of food which they sold. In this respect, therefore, Mr. Wray had done right in calling attention to the subject. With regard to how the dealer might by some simple means detect the adulteration—he would say the very best means of detection was by handing it over, with a fee, to a professional chemist.

Mr. W. G. REYNOLDS, as a practical judge of the qualities of tea, wished to state that he was in the habit of having between 200 and 300 samples in his hands daily, and he would emphatically say that the great bulk of the tea imported into this country during the last ten years was unadulterated. Upon the other points mentioned in the paper he, however, generally agreed with Mr. Wray. Adulteration had been tried; spurious tea had been sent in, so well got-up that at a little distance it would look like gunpowder, but when water was put upon it it was found to be "lie" tea, made of dust sweepings with starch. That description of adulteration had, however, long ceased, because there was no market for such an article. He fully concurred with the opinion expressed by Mr. White, that there were no better judges of good tea than the poorer classes.

Mr. LEONARD WRAY in replying upon the discussion, said, it must be apparent to anyone who prepared a paper of the description he had read that evening, that in making such assertions as he had done, some one would get up and deny them in the most emphatic manner. He had not the least hesitation in stating the authority on which he had made those assertions, but he would in the first instance reply to the inquiry which had been made by Mr. Malone as to the strength of the tea as drunk in China. He had never seen Chinese drink other than a light infusion of tea. At one time he had as many as 300 Chinese in his employ, and they drank what would be called in this country very weak tea, consisting of a light infusion of tea, and not a decoction, and it was always drunk hot. The workmen in his fields on the Straits of Malacca never drank cold water whilst at their labour, but they had buckets of warm tea in the field in the hottest sun under

the equator, by which custom the sensation known as the prickly heat, which was induced by cool drinks, was avoided. With regard to the statement that seven-eighths of the tea sent to this country was adulterated before leaving China, or previously to its being sold to European dealers, he had the authority of the meeting held in Canton in April last. It was then decidedly shown, to the satisfaction of that meeting—composed entirely of tea merchants—that adulteration to that extent was practised upon the tea. He should never have presumed to make such a statement on his own unsupported authority. With regard to the proportion of black and green tea consumed in this country, he had the authority of Mr. Waterhouse, who was himself the firm of Dakin and Co., of St. Paul's Churchyard, and elsewhere, for the statement he had made upon that subject; whilst in America, the great proportion of tea consumed was green tea. It had been stated by Mr. White that the poor were the best judges of the quality of tea, and that the public palate was the best test of the goodness of an article. He would ask in the matter of wine, was the public palate a test of genuineness of the article? And would anyone maintain that the poor ignorant masses were judges of the quality of tea? The palate of the public was what the dealers pleased to make it. They saw that to be the case, especially in the article of butter. A Londoner scarcely knew what genuine butter was. If really good butter were served to consuming customers it would not be bought, because it would not suit the public palate, so much had it been corrupted. With regard to the yield of tea per acre in China, of course he had spoken of it as an average of the entire cultivation of the country. Some good lands would produce, no doubt, from 200 to 300 lbs. per acre of manufactured tea, but in other parts, such as in the hills, where the priests resided, the crop would not amount to anything like 100 lbs. per acre; but, on the other hand, much of this "Padre's tea" sold at twenty shillings per lb. He had spoken of the quantity entirely as an average of production. He could mention that the same remark applied to the cultivation of coffee. Being one day with a party of fellow-planters in the West Indies, he asserted that within a given small circle he could pick out a dozen coffee trees which should yield 10 lbs. each. That was much doubted, but the result was he did pick out that number of trees bearing more than that quantity as an average, the smallest yield being 10 lbs., and the largest between 13 lbs. and 14 lbs. upon one tree. But what did they think was the average produce. In Jamaica, once a large coffee producing country, the average production per tree was estimated to be only a quarter of a lb., therefore he adhered to the statement that the average production of cured tea in China certainly did not exceed 100 lbs. per acre. With regard to the observations that had been made as to species, he was happy to have had the support of an authority so high as Prof. Bentley, who had distinctly asserted that there was but one species, the others being varieties. He had taken as his authority on this matter the opinions expressed by that eminent botanist, Mr. Masters, who, having been superintendent of Government tea plantations in Assam, and raised the plants from seeds, told them they were not constant, but that they differed very widely. With regard to Dr. Lankester's caution as to the speculation of cultivating tea in Natal, it appeared to him that the assertion that it was taking the plant too far from its original destination could not be supported. The tea plant had succeeded well in the United States, and would no doubt have been extensively cultivated there, if Mr. Junius Smith had not been shot down by a band of ruffians, who insisted upon molesting his property. And even in Brazil they found an enormous quantity of tea was grown. Tea had been cultivated there since 1817, commencing in 1810. In that instance, they found the tea plant transported from one end of the world to the other; and tea was also cultivated with success in the Mauritius and Bourbon, and the reason it was

not more extensively cultivated was, no doubt, because sugar paid the planters much better than tea.

Upon the motion of the Chairman, a vote of thanks was passed to Mr. Leonard Wray for his paper.

The paper was illustrated by specimens of the Tea plant, contributed by the Crystal Palace Company; several Chinese drawings, illustrating the production of tea, kindly lent by Mr. Waterhouse; and a large map of India, contributed on the part of the Government of India, by Dr. J. Forbes Watson.

The Secretary announced that on Wednesday evening next, the 30th inst., a paper by Mr. Wentworth L. Scott, "On Food; its adulterations and the methods of detecting them," would be read. On this evening W. H. Bodkin, Esq., Assistant-Judge for Middlesex will preside.

Mr. P. L. SIMMONDS writes:—The very interesting paper which was read to the members last evening was such as was contemplated from a gentleman of such extended travel and large colonial experience in all that relates to tropical products, as Mr. Wray. Had time permitted I should have wished to have added a few observations to those made by other speakers. It is, indeed, surprising that with so accommodating a plant, one which soon naturalises itself in many climates, so little should yet have been done to extend its culture in various countries, and especially in our own possessions spread over so many parts of the globe. It was long believed that no one but a Chinese could attend either to the culture or manufacture, but this has been fully disproved in Assam, Brazil, and elsewhere. The tree thrives best between the 25° and 35° North latitude. Its growth is by no means restricted to this range, but there are various other localities and elevations suited to it. Besides the attempts of Mr. Smith, alluded to by Mr. Wray, other efforts are making to grow tea in the United States; the services of Mr. Fortune have been enlisted to send both seeds and young plants; and plantations are to be laid out near Washington with it. Attention is also being drawn to the cultivation and manufacture of this and other staple products, now that the gold is failing there. Extending from 32 to 42 degrees North latitude, producing the orange, the fig, and the olive in the south, and the hardiest fruits in the north, there is a range of climate intervening that would suit the growth of the tea plant precisely, especially the foot hills of the Sierra Novada, and the coast range. Moreover, there are many thousand Chinese in the States, who are familiar with its cultivation and manufacture. Next to ourselves the United States are the most extensive consumers of tea, their consumption being about 32½ millions pounds to a population of 31,000,000; but, unlike the British, they prefer the green or coloured teas.

In the East, the culture of tea has spread very extensively to Cochin China, Japan, Java, &c., and there is no reason why it should not be carried further south into our Australian colonies. I can scarcely go so far as Mr. Wray, in his sweeping allegations as to adulterated tea, although it may be true that, owing to the rebellion, war, and increased demand for export, there may be less of the finer class of teas coming forward. Large quantities of the coarser kind of teas, prepared in Japan, have been shipped during the past year to Shanghai, and thence been re-exported to Great Britain as China tea. But I think the few adulterating leaves, and the "lie," or false tea properly so called, are rather the exceptions than the rule, and the tea purchasers in China have their eyes and wits about them in testing the classes of tea offered. With respect to the extension of tea cultivation in British India—the most encouraging field of operation—this

would add another to the very few important staples of that country, and for which there would always be a demand.

In the report of the Select Committee on Colonisation and Settlement of India, presented in 1859, attention was prominently drawn to the immense supply of tea now gradually being opened to the capital and skill of settlers on the whole line of the Himalayas; and probably in corresponding climates like that of the Neilgherries in other parts of India. It is highly probable that a taste for tea will extend itself over India. There is also reason to hope that the tea of the Himalayas may displace the tea of China in the markets of Central Asia. "The tea plant," say the Messrs. Schlagintweit, "might be cultivated all along the Himalaya range, so as to produce an almost unlimited supply of tea; it is cheaper and better than the tea of China." It appears, also, that there are different qualities of tea (though all apparently good) in different places of cultivation. The culture of the tea plant opens an immense futurity to settlers from Europe.

There is no sort of cultivation, according to the testimony of Col. Vetch, more congenial to European ideas, habits, and constitutions. I think Mr. Wray is rather severe upon the Assam Tea Company. I have always found them most obliging in giving every species of information as to their progress and prospects; and being a public company there can be little or no secrecy in their affairs, which are necessarily from time to time made public in their reports issued here and in India in the papers, so that their cultivation, crop, dividend, &c., are always known. In 1840, three years after its formation, the company produced 10,000 lbs. of tea; in 1858, 770,000 lbs.; in 1859, about 800,000 lbs.; the last crop, probably 1,000,000, whilst in a year or two more this yield is expected to be doubled. There are now at least 20 factories in operation in different parts of the province. In Debrooghur, where not long ago the jungle was infested by wild elephants and beasts of prey, there are ten plantations. The cultivation is now extending itself in Middle and Lower, as in Upper Assam. Obstacles to the cultivation, are found in the dangers from fever (which, however, disappears as the jungle is cleared away) and in the dearness of labour, aggravated by the propensity of the Assamese population to consume opium, which causes debility in the constitution and degeneracy in the race. Even the children are consumers of opium in Assam. The Assamese grow it in their gardens. Separated from Assam by the Nagra hills, lies the tea-growing country of Cachar. Before tea cultivation began, this region was almost unknown. Twelve tea companies are stated to be established here. As in Assam, labour is difficult to procure. Assam contains more waste land than would supply all England with tea, and there are thousands upon thousands of acres available for tea cultivation in Cachar.

The *Bengal Harkaru*, daily paper of Calcutta, states that Mr. Henry Mann, an enterprising gentleman who left China about five years ago, has introduced the tea tree to Southern India, having formed a plantation on the Neilgherries, which is now flourishing. The Madras Government has lately published an interesting report upon the subject. The plantation is situated above 2½ miles above Coonoor, at an elevation of 6,000 feet, with an exposure to the north-east, and contains about 6,000 plants. The ground occupied is about four acres. The plantation is on a slope. The forest land is found most suitable for the plants. It now only remains to test the leaf and to procure skilled manufacturers. The cultivation of tea in the hill districts of India seems to be spreading fast, and as these are the localities recommended for European colonization, we may yet see India rivalling China in this trade, and sturdy Anglo-Saxon pickers depicted on the tea chests instead of almond-eyed long-tailed men of China.

General Cullen has also reported to the Madras Government, the successful culture of the tea plant in Travancore.

It thrives both at the level of the sea and at altitudes of 1,800 and 3,200 feet. He points to the "Cardamum Hills of Travancore," a tract of land from 50 to 60 miles in length and 10 to 25 in breadth, as admirably suited for the cultivation. The tendency of the plant is to luxuriant growth, but this is checked by selecting ground at high altitudes and with a less humid climate. Government has directed Dr. Cleghorn, the conservator of forests, to visit and report on these tea plantations.

8, Winchester-street, S.W., January 24.

SEAL LOCK FOR MINERS' SAFETY LAMPS.*

A cheap, convenient, and secure means of preventing safety lamps being opened without the certainty of detection, would render explosions of coal mine gases almost impossible, for there is no well-authenticated instance of explosion from a proper safety lamp, and men would not venture to open their lamps if detection were certain, and punishment consequently inevitable. The locks for lamps in common use are not secure, and locks with complex wards and tumblers, though difficult to pick, would be costly and inconvenient.

Mr. Holland, one of the medical inspectors of the Burial Department of the Home Office, has adapted a seal lock for safety lamps, which he freely offers for the use of colliers. It consists of a narrow strip of thin brass, with the ends so punched that they can be locked or riveted together in an instant by squeezing them with pincers. The strip is to be passed round any two parts of the lamp, which must be separated in opening. The lamp cannot be opened without breaking the seal.

The danger from the men lighting pipes by drawing flame through the gauze, may be prevented by surrounding the lamp with a glass, as in Stephenson's lamp and others.

Mr. Holland has just been informed that a lock on a somewhat similar principle has been made, but not much used. He trusts, however, that the plan will be fairly tried, or a better one contrived.

MEETINGS FOR THE ENSUING WEEK.

MON. ...Actuaries, 7.

Entomological, 8. Anniversary.

Geographical, 8. "North Atlantic Telegraph."—1. Capt. Sir F. L. McClintock, "Surveys of the *Bulldog*." 2.

Capt. Allen Young, "Surveys of the *Fox*." 3. Dr. John Rae, "Explorations in the Faroes and Iceland." 4. Mr. F. J. Taylor, "The Fjords of South Greenland." 5. Col. Shaffner, "Electric Circuits."

Medical, 8. "Dr. Thudichum, "On the physiological and therapeutic effects of the Turkish Bath."

TUES. ...Royal Inst., 3. Prof. Owen, "On Fishes."

Civil Engineers, 8. Continued discussion upon Mr. Braithwaite's paper "On the Rise and Fall of the River Wandle."

WED. ...Society of Arts, 8. Mr. Wentworth L. Scott, "On Food: its Adulterations and the Methods of Detecting them."

Royal Soc. Club, 6.

Royal, 8.

Antiquaries, 8.

FRI.Archaeological Inst., 4.

Royal Inst., 8. Rev. Alex. J. D. D'Orsay, "On the Study of the English Language as an essential part of a University Course."

SAT.Asiatic, 3.

Royal Inst., 3. Dr. E. Frankland, "On Inorganic Chemistry."

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette, January 18th, 1861.]

Dated 15th November, 1860.

2810. G. Gill, 37, Francis-street, Newington, Surrey—Imp. in "steam rams" and other "ships of war," for the purpose of doing away with the necessity of employing rifled cannon, or other "long range ordnance," against armour plated and other ships in maritime engagements.

* Manufactured by J. Davis, 19, Percival-street, Clerkenwell.

Dated 11th November, 1860.

2828. J. H. Radcliffe, King-street, Oldham, Lancashire—Imp. in lubricating or oiling vessels, and in apparatus connected therewith.

Dated 19th November, 1860.

2836. H. A. Jewett, Sawley, Derbyshire—Imp. in the method of heating or firing ovens for the manufacture of pottery and porcelain by means of gas, and in apparatus connected therewith.

Dated 11th December, 1860.

3033. R. A. Ford and W. A. Paige, 38, Poultry—An improved shirt.

Dated 12th December, 1860.

3051. A. Kyle, Bingham, Aberdeen—Imp. in machinery or apparatus for propelling ships or vessels and boats.

Dated 17th December, 1860.

3092. N. C. Szerelmey, 6, Park-terrace, Brixton-road, Surrey—An improved method of, and apparatus for, purifying oils and varnishes.

Dated 22nd December, 1860.

3144. C. Peters, Coventry—Imp. in looms used in the manufacture of ribbons and other fabrics.

Dated 24th December, 1860.

3156. W. E. Newton, 66, Chancery-lane—An improved archers' bow and bow gun toy. (A com.)

3158. J. L. Norton, 33, Belle Sauvage-yard, Ludgate-hill—Imp. in apparatus for drying wool and other fibres.

Dated 26th December, 1860.

3162. C. Lizar, 36, Rue Lafayette, Paris—Imp. in gas meters.

3164. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in instruments for assisting the sense of hearing. (A com.)

Dated 27th December, 1860.

3166. W. Darby, Birmingham—Imp. in constructing and working stamps for cutting and shaping metals.

3168. W. Parry, High-street, Deptford—Imp. in the manufacture of chimney pots, pedestals, and such like articles made from clay or plastic materials, and machinery for that purpose.

3170. R. A. Broome, 166, Fleet-street—Imp. in axle boxes and in naves of wheels. (A com.)

3172. W. Hill, 103, Milton-street, and H. Barber, 60, Thomas-street, Sheffield—An imp. in the manufacture of spring knife scales and knife handles.

3174. W. R. Mulley, 10, Lockyer-street, Plymouth—Imp. in apparatus for steering ships or vessels.

3176. A. V. Newton, 66, Chancery-lane—An imp. in the construction of bedsteads. (A com.)

Dated 28th December, 1860.

3180. I. Dimock, Manchester—Imp. in machinery for cleaning, sorting according to size, and doubling silk and other threads. (Partly a com.)

3184. J. S. Russell, Great George-street, Westminster—Imp. in constructing and arming ships and vessels, and also floating and land batteries.

Dated 29th December, 1860.

3186. W. Clark, 53, Chancery-lane—An improved tissue, fabric, or structure. (A com.)

Dated 31st December, 1860.

3191. J. Midgley, J. Sugden, and W. Clapham, Keighley, Yorkshire—Imp. in trombones.

3195. W. Eades, Birmingham—An improved screw-wrench.

3196. W. Clissold, Dudbridge, Gloucestershire—An improved construction of clutch for driving gear.

Dated 1st January, 1861.

1. E. Tomlinson, Manchester—An improved apparatus for facilitating the placing of cop tubes on the spindles of spinning and doubling machines.

2. G. Cook, Croydon—An improved watch movement.

3. M. Henry, 84, Fleet-street—Imp. in breaks applicable to carriages and rolling stock, used on railways and elsewhere. (A com.)

4. M. Henry, 84, Fleet street—An improved slide valve. (A com.)

5. P. Campbell, India-terrace, West India-road, and T. A. Kendall, Cowley-street, St. George's-in-the-East—Imp. in sails and apparatus used therewith.

Dated 2nd January, 1861.

8. J. F. Belfield, Primley-hill, Paignton, Devonshire—Imp. in reaping and mowing machines.

9. W. Morgan, Liverpool—The application of certain metals for the manufacture of "coaling," "swill," and similar baskets.

10. J. Taylor and M. R. Cooper, Liverpool—Imp. in the construction of rotary engines.

11. E. B. West, 24, Longford-terrace, Dublin—Imp. in the process of making worts and washes in brewing and distilling, and in combination and adaptation of apparatus connected with the same, and for novel apparatus connected with the same. (A com.)

Dated 3rd January, 1861.

12. P. A. Moore, Penge, Surrey—Improved feet for levelling clocks and other articles.

13. C. Stevens, 18, Welbeck-street, Cavendish-square—An improved apparatus for stopping runaway horses. (A com.)

14. W. C. Fuller, 2, Bucklersbury, and J. A. Jaques and J. Fansawe, Tottenham—Imp. in the adaptation of india-rubber and analogous gums, and compounds thereof, to valves, pump buckets, packing and other parts of steam, water, air, and gas engines and apparatus.

15. W. Heywood, Manchester—Imp. in machinery for grinding rollers and cylinders covered with card teeth.

17. A. V. Newton, 66, Chancery-lane—Imp. in the construction of air or gas engines. (A com.)

Dated 4th January, 1861.

21. J. Wright, 42, Bridge-street, Blackfriars—Imp. in machines for forming the heels of boots and shoes. (A com.)

23. W. H. Hore, Liverpool—Imp. in machinery or apparatus for measuring and registering the lengths of woollen, flax, cotton, and other fabrics applicable to registering lengths, distances, and revolutions generally.

25. A. Fairbairn, Leeds—An improved construction of forging press or hammer. (A com.)

Dated 5th January, 1861.

27. L. C. E. Vial, Paris—Imp. in the manufacture of colouring matters and pigments from coal oil, raw naphthaline, and from the waste lime from gas works.

29. J. Watson, Glasgow, and C. F. Halle, Manchester—Imp. in spinning or twisting fibrous materials.

31. W. E. Gedge, 11, Wellington-street, Strand—Imp. in obtaining motive power. (A com.)

33. J. Sugden, J. Midgley, and W. Clapham, Keighley, Yorkshire—Imp. in the construction of covered rollers used in machinery for preparing and spinning fibrous materials.

35. J. Conlong, Belfast—Imp. in machines or engines employed for carding cotton, silk, flax, wool, and other fibrous substances.

37. J. I. Grylls, Murton-street, Sunderland—Imp. in anchors.

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

69. B. Hause, Vermont, U.S.—A new and useful or improved machine either for supporting clothes or other articles to be dried, or for other purposes. 10th January, 1861.

93. J. Gibbs, Brentford, Middlesex—Imp. in constructing submerged works. 12th January, 1861.

PATENTS SEALED.

[From Gazette, January 18th, 1861.]

January 18th.

1751. W. Barrett. 1895. J. Higgins and T. S. Whitworth. 1922. C. F. Flounders. 1925. A. V. Newton. 1958. T. Greenwood. 1967. W. Field and E. Jeffreys. 1980. C. Green and W. Asbury. 2007. A. V. Newton. 2069. A. V. Newton. 2071. P. Effertz. 2110. W. E. Newton. 2111. J. G. Willans. 2143. W. E. Newton. 2344. T. Brookes and T. Adams. 2499. J. J. Russell and B. L. Brown. 2651. W. T. Vose. 2669. F. Johnson. 2682. W. Clark. 2771. H. E. West. 2885. D. Auld. 2869. E. Monkhouse.

[From Gazette, January 22nd, 1861.]

January 22nd.

1805. C. W. Lancaster. 1821. S. Terrill. 1834. G. C. A. Marquis d'Auxy. 1806. J. L. L. Cambaceres. 1842. S. A. Carpenter. 1848. H. Greaves. 1809. R. T. Smith & T. Buckley. 1824. R. A. Broome.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[From Gazette, January 18th, 1861.]

January 14th.

73. R. Archibald. 100. C. Bishworth. 102. J. J. Russell. 112. H. Smith. 119. J. Brown. 121. T. Hamilton and J. Hamilton. 119. J. Wilson.

January 15th.

91. T. Pirie. 116. P. Wilson, S. Northall, and T. James. 106. W. White. 129. R. A. Smith and A. McDougall.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[From Gazette, January 22nd, 1861.]

January 18th.

129. J. North. 129. R. A. Smith and A. McDougall.

January 19th.